SamHop Microelectronics Corp.

STM4470E

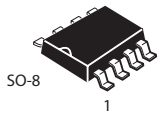
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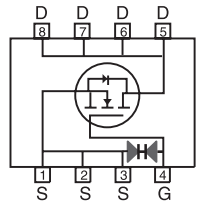
N-Channel Enhancement Mode Field Effect Transistor

PRODUCT SUMMARY		
V_{DSS}	I_D	$R_{DS(ON)}$ (m Ω) Max
40V	9.5A	12 @ V_{GS} = 10V
		15 @ V_{GS} = 4.5V

FEATURES

- Super high dense cell design for low $R_{DS(ON)}$.
- Rugged and reliable.
- Surface Mount Package.
- ESD Protected.





ABSOLUTE MAXIMUM RATINGS (T_A=25 C unless otherwise noted)

Parameter	Symbol	Limit	Unit
Drain-Source Voltage	V_{DS}	40	V
Gate-Source Voltage	V_{GS}	±20	V
Drain Current-Continuous [a] @T_J=25°C	I_D	9.5	A
-Pulsed [b]	I_{DM}	39	A
Drain-Source Diode Forward Current [a]	I_S	1.7	A
Maximum Power Dissipation [a]	P_D	2.5	W
Operating Junction and Storage Temperature Range	T_J, T_{STG}	-55 to 150	°C

THERMAL CHARACTERISTICS

Thermal Resistance, Junction-to-Ambient [a]	$R_{\theta JA}$	50	°C/W

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ELECTRICAL CHARACTERISTICS (T_A=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ [C]	Max	Unit
OFF CHARACTERISTICS						
Drain-Source Breakdown Voltage	BV_{DSS}	V_{GS}=0V, I_D=250uA	40			V
Zero Gate Voltage Drain Current	I_{DSS}	V_{DS}=32V, V_{GS}=0V			1	uA
Gate-Body Leakage	I_{GSS}	V_{GS}=±20V, V_{DS}=0V			±10	uA
ON CHARACTERISTICS [b]						
Gate Threshold Voltage	$V_{GS(th)}$	V_{DS}=V_{GS}, I_D=250uA	1	1.7	3	V
Drain-Source On-State Resistance	$R_{DS(ON)}$	V_{GS}=10V, I_D=10A		10	12	m ohm
		V_{GS}=4.5V, I_D=6A		12	15	m ohm
On-State Drain Current	$I_{D(ON)}$	V_{DS}=10V, V_{GS}=10V	20			A
Forward Transconductance	g_{FS}	V_{DS}=10V, I_D=10A		25		S
DYNAMIC CHARACTERISTICS [c]						
Input Capacitance	C_{ISS}	V_{DS}=20V, V_{GS}=0V f=1.0MHz		1500		pF
Output Capacitance	C_{OSS}			220		pF
Reverse Transfer Capacitance	C_{RSS}			150		pF
SWITCHING CHARACTERISTICS [c]						
Turn-On Delay Time	$t_{D(ON)}$	V_{DD}=15V I_D=1A V_{GS}=10V R_{GEN}=6 ohm		23		ns
Rise Time	t			22		ns
Turn-Off Delay Time	$t_{D(OFF)}$			88		ns
Fall Time	t			27		ns
Total Gate Charge	Q_g	V_{DS}=15V, I_D=10A, V_{GS}=10V		28		nC
		V_{DS}=15V, I_D=10A, V_{GS}=4.5V		12.5		nC
Gate-Source Charge	Q_{gs}	V_{DS}=15V, I_D=10A V_{GS}=10V		3		nC
Gate-Drain Charge	Q_{gd}			6		nC

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ELECTRICAL CHARACTERISTICS (T_A=25°C unless otherwise noted)

Parameter	Symbol	Condition	Min	Typ [c]	Max	Unit
DRAIN-SOURCE DIODE CHARACTERISTICS [b]						
Diode Forward Voltage	V_{SD}	V_{GS} = 0V, Is =1.7A		0.73	1.2	V

Notes

a.Surface Mounted on FR4 Board, t≤10sec.
b.Pulse Test:Pulse Width≤300us, Duty Cycle≤2%.
c.Guaranteed by design, not subject to production testing.

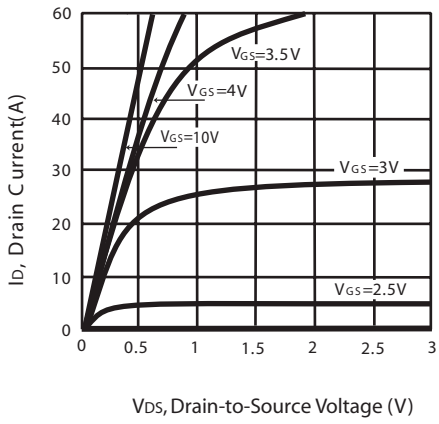


Figure 1. Output Characteristics

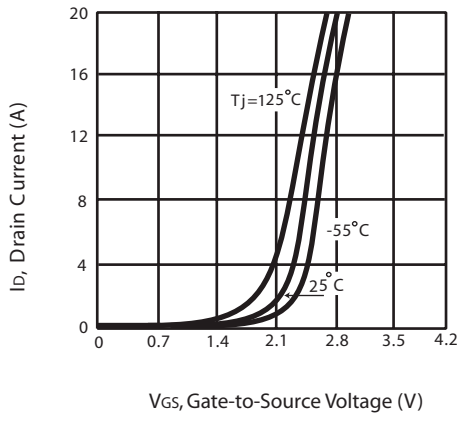


Figure 2. Transfer Characteristics

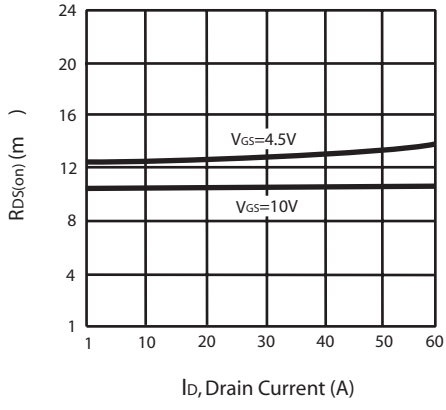


Figure 3. On-Resistance vs. Drain Current and Gate Voltage

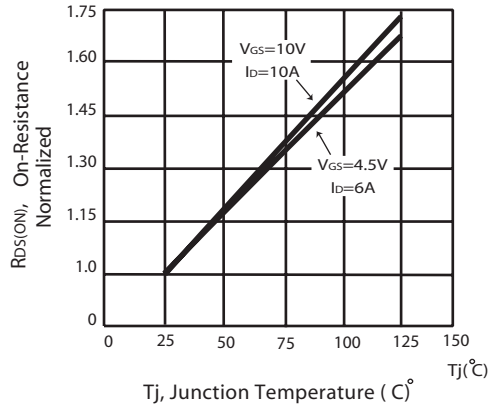


Figure 4. On-Resistance Variation with Drain Current and Temperature

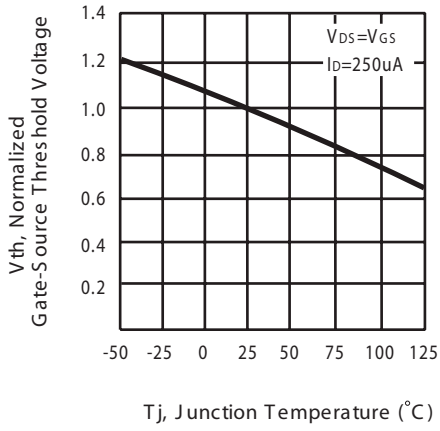


Figure 5. Gate Threshold Variation with Temperature

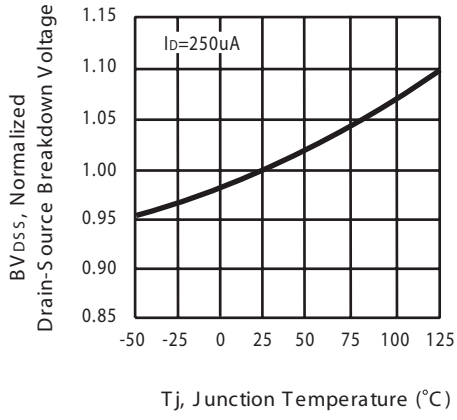


Figure 6. Breakdown Voltage Variation with Temperature

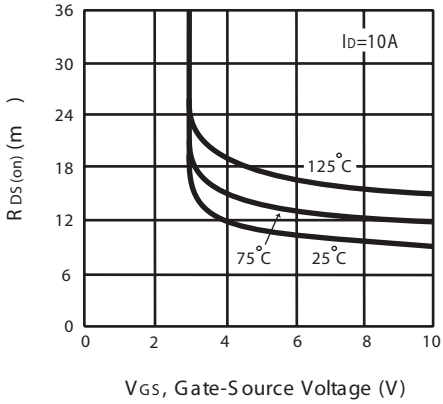


Figure 7. On-Resistance vs. Gate-Source Voltage

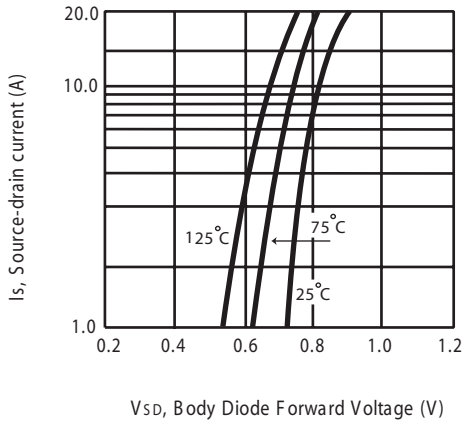


Figure 8. Body Diode Forward Voltage Variation with Source Current

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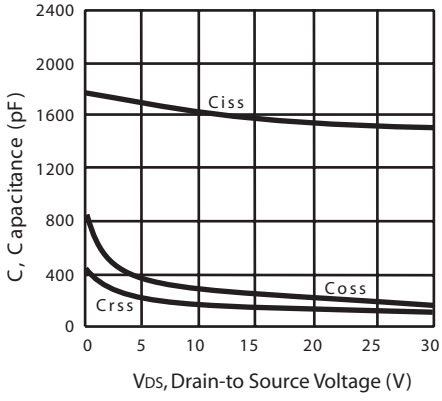


Figure 9. Capacitance

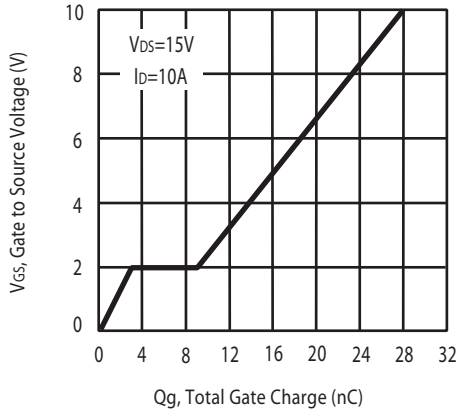


Figure 10. Gate Charge

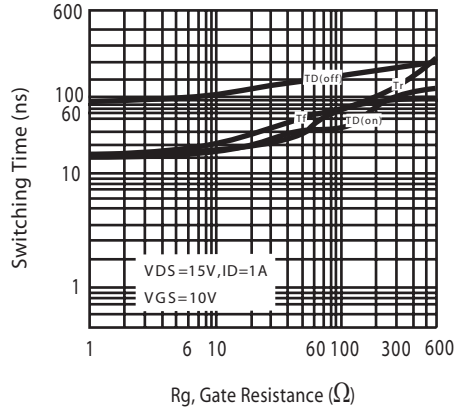


Figure 11.switching characteristics

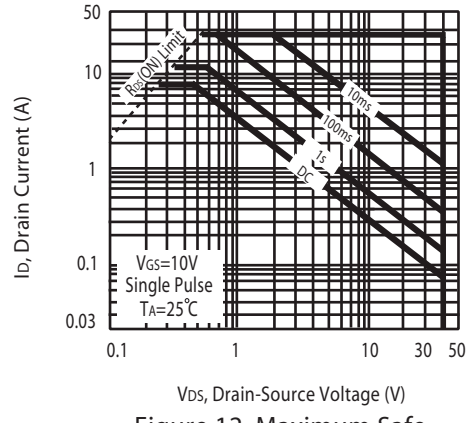
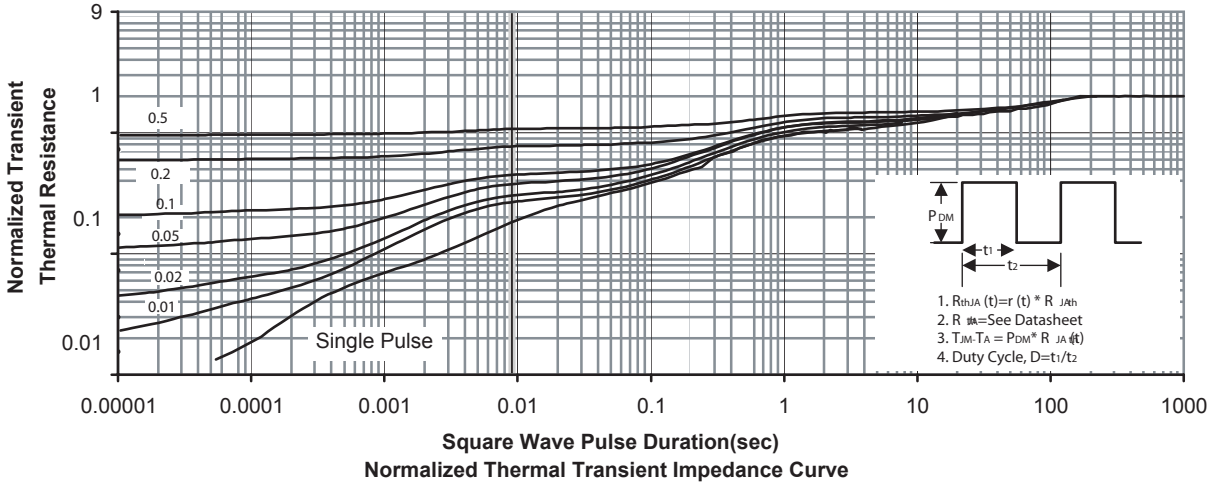


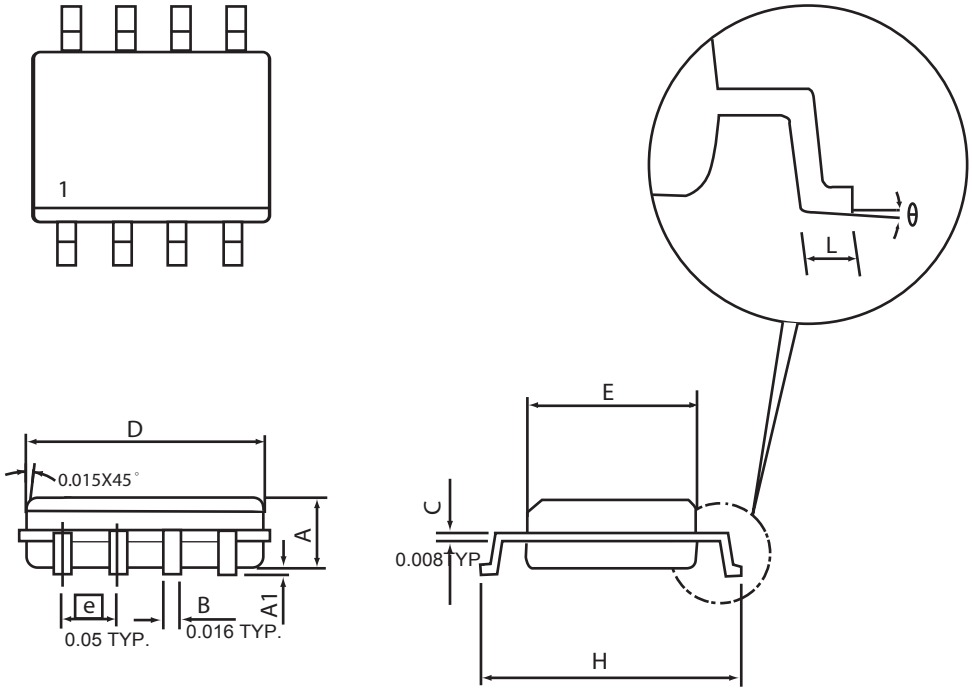
Figure 12. Maximum Safe Operating Area



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PACKA GE OUTLINE DIMENSIONS

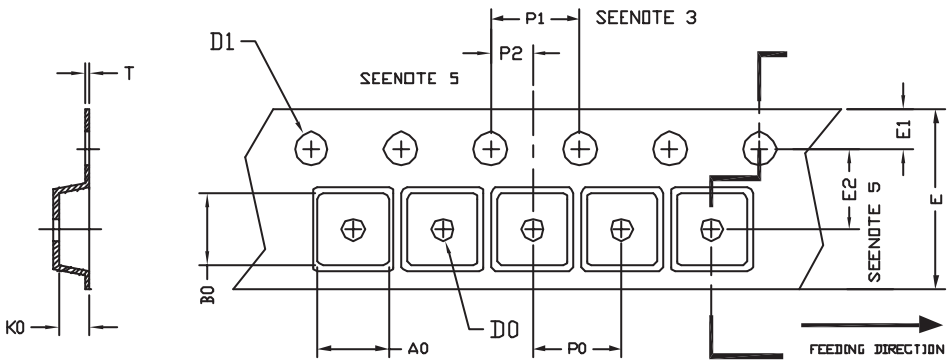
SO-8



SYMBOLS	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.35	1.75	0.053	0.069
A1	0.10	0.25	0.004	0.010
D	4.80	4.98	0.189	0.196
E	3.81	3.99	0.150	0.157
H	5.79	6.20	0.228	0.244
L	0.41	1.27	0.016	0.050
θ	0°	8°	0°	8°

SO-8 Tape and Reel Data

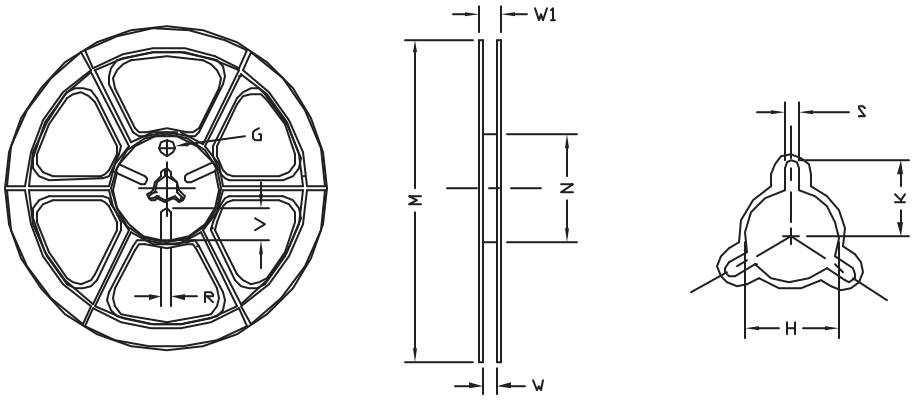
SO-8 Carrier Tape



unit:mm

PACKAGE	A0	B0	K0	D0	D1	E	E1	E2	P0	P1	P2	T
SOP 8N 150mil	6.40	5.20	2.10	ϕ1.5 (MIN)	ϕ1.5 + 0.1 - 0.0	12.0 ±0.3	1.75	5.5±0.05	8.0	4.0	2.0±0.05	0.3±0.05

SO-8 Reel



UNIT:mm

TAPE SIZE	REEL SIZE	M	N	W	W1	H	K	S	G	R	V
12 mm	ϕ330	330 ± 1	62 ±1.5	12.4+ 0.2	16.8- 0.4	ϕ12.75 + 0.15	---	2.0±0.15	---	---	---